

INTERNATIONAL SEARCH REPORT

Intern 1al Application No

PCT/GB 00/03343

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61L27/34 A61L27/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 633 032 A (SUMITOMO ELECTRIC INDUSTRIES) 11 January 1995 (1995-01-11) column 5, line 28; claims; examples 1,2	1-15
Y	EP 0 183 365 A (COATS LTD J & P) 4 June 1986 (1986-06-04) cited in the application claims; examples	1-15
A	EP 0 742 020 A (NICEM LTD) 13 November 1996 (1996-11-13) claims; examples	1-15
A	US 5 851 229 A (DEPREKER JENNIFER ET AL) 22 December 1998 (1998-12-22) column 4, line 16 - line 46; claims	1-15
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

4 December 2000

Date of mailing of the international search report

11/12/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

ESPINOSA, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03343

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 292 362 A (EATON ALEXANDER M ET AL) 8 March 1994 (1994-03-08) column 5, line 28; claims -----	1-15
A	US 4 902 290 A (WERNER HEINZ-HELMUT ET AL) 20 February 1990 (1990-02-20) cited in the application -----	
A	GB 854 715 A (AKTIEBOLAGET PHARMACIA) 23 November 1960 (1960-11-23) cited in the application -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03343

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0633032	A	11-01-1995	JP 7067895 A	14-03-1995
			AU 692445 B	11-06-1998
			AU 6596094 A	05-01-1995
			CA 2126608 A	26-12-1994
			US 5584877 A	17-12-1996
EP 0183365	A	04-06-1986	AT 83911 T	15-01-1993
			AU 569645 B	11-02-1988
			AU 5059385 A	05-06-1986
			CA 1249490 A	31-01-1989
			DE 3586941 A	11-02-1993
			DE 3586941 T	29-04-1993
			DK 551185 A	31-05-1986
			ES 548138 D	16-02-1988
			ES 8801577 A	16-04-1988
			GR 852872 A	03-04-1986
			IE 59421 B	23-02-1994
			JP 1585374 C	31-10-1990
			JP 2011258 B	13-03-1990
			JP 61135651 A	23-06-1986
			US 4747848 A	31-05-1988
EP 0742020	A	13-11-1996	JP 8294530 A	12-11-1996
			CN 1142974 A	19-02-1997
			US 5986168 A	16-11-1999
US 5851229	A	22-12-1998	AU 4414097 A	02-04-1998
			EP 0941131 A	15-09-1999
			WO 9810804 A	19-03-1998
US 5292362	A	08-03-1994	US 5209776 A	11-05-1993
			AT 183656 T	15-09-1999
			AU 8497991 A	02-03-1992
			CA 2087957 A	28-01-1992
			DE 69131556 D	30-09-1999
			DE 69131556 T	20-07-2000
			EP 0542880 A	26-05-1993
			ES 2137930 T	01-01-2000
			JP 6507376 T	25-08-1994
			WO 9202238 A	20-02-1992
US 4902290	A	20-02-1990	DE 3608158 A	17-09-1987
			AT 66126 T	15-08-1991
			BR 8701135 A	05-01-1988
			CA 1283505 A	30-04-1991
			DE 3772070 A	19-09-1991
			DK 127987 A	13-09-1987
			EP 0237037 A	16-09-1987
			FI 871065 A, B,	13-09-1987
			GR 3002895 T	25-01-1993
			JP 1051263 B	02-11-1989
			JP 1563185 C	12-06-1990
			JP 62258666 A	11-11-1987
			MX 165145 B	29-10-1992
			NO 870809 A, B,	14-09-1987
			US 4784659 A	15-11-1988
GB 854715	A		CH 413811 A	31-05-1966

Information on patent family members

PCT/GB 00/03343

GB 854715 A DE 1418013 A 17-10-1968
SE 169293 A

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P24444A/SCR	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 03343	International filing date (day/month/year) 01/09/2000	(Earliest) Priority Date (day/month/year) 03/09/1999
Applicant SULZER VASCUTEK LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P24444A/SCR	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/03343	International filing date (day/month/year) 01/09/2000	Priority date (day/month/year) 03/09/1999
International Patent Classification (IPC) or national classification and IPC A61L27/34		
Applicant SULZER VASCUTEK LIMITED et al.		


1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 09/02/2001	Date of completion of this report 02.08.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Langer, A Telephone No. +49 89 2399 7809



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03343

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-19 as originally filed

Claims, No.:

1-15 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03343

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-15
	No: Claims
Inventive step (IS)	Yes: Claims 1-15
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-15
	No: Claims

2. Citations and explanations
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/03343

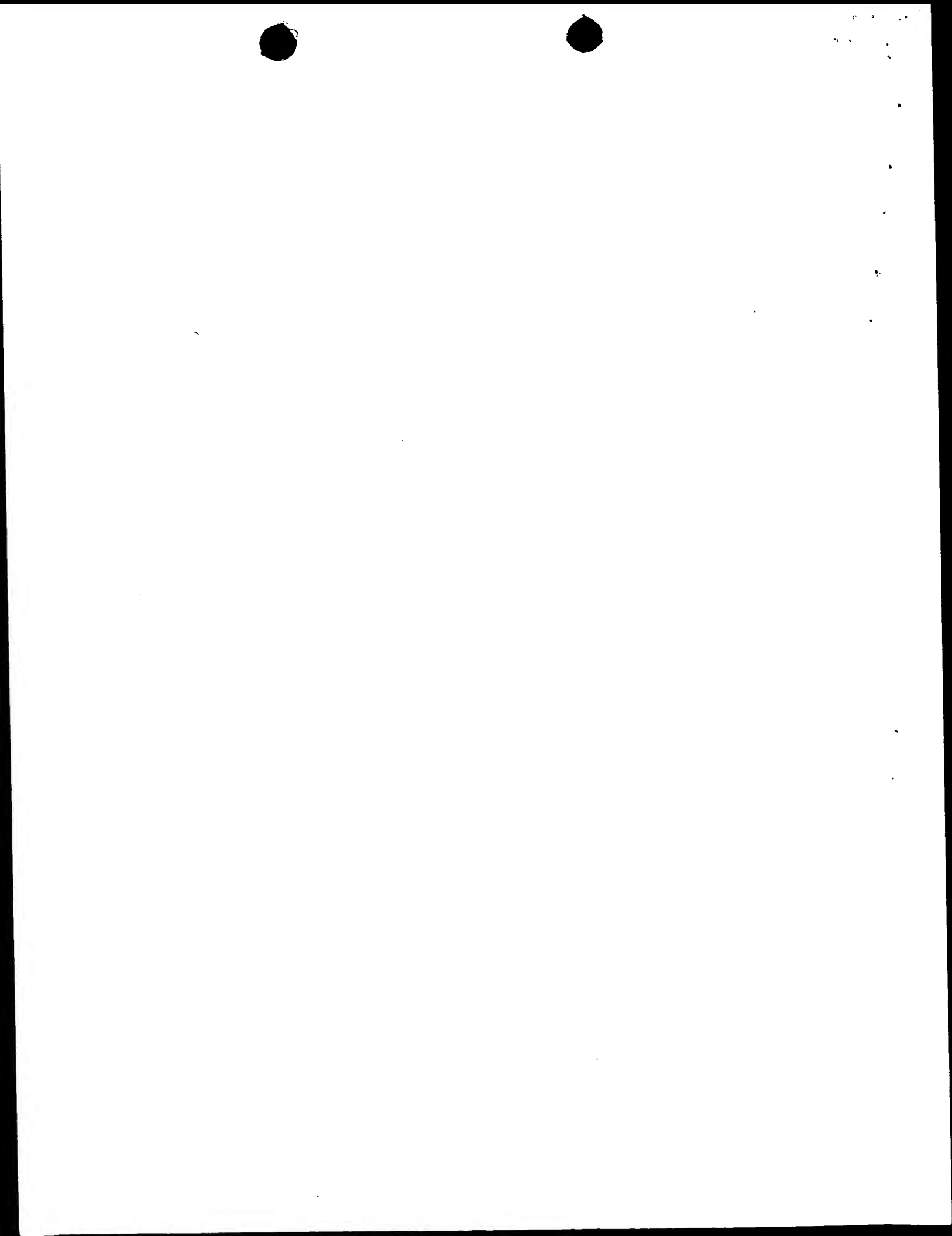
Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The use of a polymer formed by cross-linking dextran molecules by formaldehyde and urea condensation as bioresorbable sealant composition for coating a prosthetic graft is not disclosed nor indicated by the relevant prior art (see International Search Report). The same applies for the methods of producing such coating or graft.

Claims 1-15 therefore appear novel and inventive in terms of Art. 33 (2) (3) PCT.

Claims 1-15 also fulfill the criteria for industrial applicability in terms of Art. 33 (4) PCT.



1 cross-linked dextran. Dextran is produced by a
2 fermentation process using *Leuconostoc mesenteroides*
3 bacteria growing on a sugar-based energy source, such
4 as sucrose. Partial hydrolysis of the fermentation
5 product yields dextrans of defined molecular weight.
6 These have been used widely as plasma substitutes with
7 a typical molecular weight of 40,000.

8
9 Dextrans of this molecular weight are freely water-
10 soluble. To form a useful graft sealant, the dextrans
11 must be rendered insoluble. However, dextrans are not
12 easily cross-linked as they have limited reactive sites
13 to form intermolecular bonds. The available groups are
14 almost exclusively hydroxyl (OH) groups.

15
16 British Patent No 854,715 describes the formation of a
17 dextran-based polymer by using epichlorohydrin.
18 However the epichlorohydrin-based approach forms very
19 stable cross-links so that the resultant polymer is
20 resistant to both enzymatic and hydrolytic attack and
21 does not biodegrade. Epichlorohydrin cross-linked
22 dextran is, therefore, unsuitable as a vascular graft
23 sealant as it is not bioresorbable and would not permit
24 tissue ingrowth within the timescale required. EP-B-
25 0,183,365 and US-A-4,747,848 both describe a gelatin-
26 based sealant in which the time-scale of reabsorption
27 is controllable.

28

29 To overcome this problem, a novel dextran-based polymer
30 has been produced which is bioresorbable through
31 hydrolysis in the time scale of interest.

32

